# Polynomial Operations PRACTICE (version 12)

**1. Let polynomials $p(x)$ and $q(x)$ be defined below.**

$$p(x) = 7x^5 - 5x^4 - 4x^2 + 2x + 3$$

$$q(x) = 10x^5 - 7x^4 + 8x^3 - 5x^2 - 1$$

**Express the difference $q(x) - p(x)$ in standard form.**

**2. Let polynomials $a(x)$ and $b(x)$ be defined below.**

$$a(x) = 4x^2 - 6x + 5$$

$$b(x) = -8x + 4$$

**Express the product $a(x) \cdot b(x)$ in standard form.**

**3. Express $(x + 1)^6$ in standard (expanded) form.**

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**4. Let polynomials $f(x)$ and $g(x)$ be defined below.**

$$f(x) = -x^3 + 6x^2 + 16x - 2$$
$$g(x) = x - 8$$

**The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, $R$ (a real number).**

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 8}$$

**By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder $R$.**

**5. Let polynomial $f(x)$ still be defined as $f(x) = -x^3 + 6x^2 + 16x - 2$. Evaluate $f(8)$.**